



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/578,957 | 05/10/2006 | Malcolm J. Kudra | 32483-08 | 8650 |
| 7590 John B Hardway III Nexsen Pruet P O Box 10107 Greenville, SC 29603 | | | | |
| | | | EXAMINER | |
| | | | BITAR, NANCY | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2624 | |
| | | | MAIL DATE | DELIVERY MODE |
| | | | 09/23/2009 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/578,957

Applicant(s)

KUDRA ET AL

Examiner

NANCY BITAR

Art Unit

2624

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 16-21 is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12-15 is/are rejected.
- 7) ☐ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S508)
- Paper No(s)/Mail Date 5/10/2006
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Examiner Notes

1. Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4,6,9,12,14 and 15 rejected under 35 U.S.C. 102(b) as being anticipated by Houseman (3,982,910)

As to claim1, Houseman teaches the method of combusting a liquid primary fuel comprising the steps of:
establishing a zone of combustion, spaced from a fuel nozzle, and defined by a flame of ignited hydrogen (producing hydrogen-rich product gases by mixing a spray of liquid hydrocarbon with a stream of air in a startup

procedure and the mixture is ignited for partial oxidation, then the stream of air is heated by the resulting combustion to reach a temperature such that a signal is produced, see abstract , figure 5) , dispersing a liquid primary fuel through said fuel nozzle into the zone of combustion in a partially vaporized state and partially atomized state (the mixture is ignited and partial oxidation is permitted, column 1, lines 60-68) ; and burning the vaporized liquid primary fuel and the atomized liquid primary fuel entering said zone of combustion (see figure 6 and column 3, lines 58-column 5 lines 20-36) .

As to claim 2 , Houseman teaches the method of claim 1 wherein the zone of combustion zone is defined by a generally conical surface symmetric about a longitudinal axis (see figure 6).

As to claim 3 and 4 , Houseman teaches the method of claim 1 wherein the hydrogen combustion zone is established by the steps of: providing a pressurized source of hydrogen through a conduit having a discharge opening adjacent said zone of combustion(column 2, lines 12-23), igniting the hydrogen discharged through said discharge opening to produce a hydrogen flame; and rotating the hydrogen flame about a longitudinal axis of the zone of combustion (18, figure 6 and figure 5) .

As to claim 6 , Houseman teaches the method of claim 6 where the source of hydrogen flowing through the conduit comprises a predetermined mixture of hydrogen and oxygen (column 1, lines 15-48) .

As to claim 9 , Houseman teaches the method of claim 3 wherein said discharge opening is radially spaced from said longitudinal axis and angled toward the central axis of rotation (he start up nozzle 54 is represented by the dashed central line. When the two way valve is operated to apply the hydrocarbon fuel to the vaporizing

coil, then the premixed feed gases are directed into two helical tubes respectively 70, 72 and the two passages between the tubes, and are thereafter directed into the combustion chamber as a strongly outwardly rotating annulus of gas represented by four streams that merge as they come out, two of which are shown as 74, 76. The length of the flame that exists can be tailored by changing the angle of the helical path in the burner. A steeper angle results in a longer flame. There is a tradeoff between the length of flame and the fact that the longer flame keeps the hottest part of the flame in the center and off the walls of the combustion chamber, column 5 , lines 20-36).

As to claim 12 , Houseman teaches the method of claim 1 where said primary fuel is selected from the group comprising processed and unprocessed vegetable oils, by-product oils from agricultural products processing, liquid and liquefied petroleum fuels, and liquid and liquefied animal fats (column 1, lines 11-49).

As to claims 14 and 15 , Houseman teaches the method of claim 1 further including a step of injecting a controlled rate of an additive selected from steam and water into the zone of combustion to control the formation of oxides of nitrogen (column 1, lines 32-44).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 5,7,8,10, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Houseman (3,982,910) in view of applicant admitted prior art,

As to claim 5,7, 8and 10; while Houseman meets a number of the limitations of the claimed invention, as pointed out more fully above, Houseman fails to specifically teach the step of setting a speed of the rotating hydrogen flame to optimize a combustion efficiency of the primary fuel and that the predetermined mixture is a molar ratio of hydrogen to oxygen having a value of 2:1. It would have been obvious to one of ordinary skill in the art to have incorporated the claimed speed and range into the invention because it has been held where the general condition of a claim are disclosed in the prior art discovering the ratio or the values involves only routine skill in the art. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim 8 and 13, while Houseman meets a number of the limitations of the claimed invention, as pointed out more fully above, Houseman fails to specifically teach generating a constant rate of hydrogen and oxygen gases from the electrolysis of water, and transferring the hydrogen and oxygen gases into a fixed-volume staging chamber such that the hydrogen and oxygen gases are continuously exposed to an inlet opening of conduit. it is obvious that electrolysis of water is a source of hydrogen and oxygen is for the gases. As water is relatively plentiful, electrolysis of water to separate the hydrogen and oxygen molecules found in H₂O is one of the convenient source in hydrogen fuel cell technology. Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate electrolysis of water

as a source for hydrogen and oxygen into the invention in order to have a plentiful supply of Hydrogen and oxygen.

Claim Objections

6. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7.

Allowable Subject Matter

8. Claims 16-21 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

While Houseman teaches A process and apparatus are described for producing hydrogen-rich product gases by mixing a spray of liquid hydrocarbon with a stream of air in a startup procedure and the mixture is ignited for partial oxidation, then the stream of air is heated by the resulting combustion to reach a temperature such that a signal is produced. The signal triggers a two way valve which directs liquid hydrocarbon from a spraying mechanism to a vaporizing mechanism with which a vaporized hydrocarbon is formed. The vaporized hydrocarbon is subsequently mixed with the heated air in the combustion chamber where partial oxidation takes place and hydrogen-rich product gases are produced . Schirmer et al (US 5,055,030) teaches a fuel is burned in a

combustion chamber in the presence of a combustion supporting gas to produce a flue gas substantially free of unburned fuel at the outlet end of the combustion chamber and steam is generated by introducing water, in a generally radial direction, into the flue gas adjacent the downstream end of the combustion chamber to produce a mixture of flue gas and water and vaporize a major portion of the water to produce a mixture of flue gas and steam. In yet another aspect of the present invention, steam is generated by burning a fuel in the presence of a combustion supporting gas in a combustion chamber to produce a flue gas at the downstream end of the combustion chamber, steam is generated by introducing water into the flue gas adjacent the downstream end of the combustion chamber, the mixture of flue gas and water is passed through a vaporization chamber to vaporize a major portion of the water and produce a mixture of flue gas and steam and the outlet pressure at the downstream end of the vaporization chamber is varied to control said outlet pressure. None teaches *a primary fuel conduit formed inside the shaft, said conduit having an inlet port for receiving the liquid primary fuel and an axial portion running perpendicular to the longitudinal axis of the shaft for transporting the primary fuel from the inlet port to the burner tip flange, a coolant chamber formed around the shaft closest to the distal end for containing a circulating coolant fluid, a hydrogen chamber containing a pressurized hydrogen gas source in fluid communication with said hydrogen transport channels; and a primary fuel chamber containing a pressurized primary liquid fuel in fluid communication with said primary fuel conduit.*

The Examiner finds no reason or motivation to combine the above references in an obviousness rejection thus placing the application in condition for allowance.

Any comments considered necessary by applicant must be submitted on later than the payment of the issue fee and to avoid processing delays should preferably accompany the issue fee. Such submissions should be clearly labeled, comments on statement of reasons for allowance.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NANCY BITAR whose telephone number is (571)270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nancy Bitar/
Examiner, Art Unit 2624

/VIKKRAM BALI/
Supervisory Patent Examiner, Art Unit 2624